

Surveillance Safari

Recognizing the Ways the Cops Spy on Populations

São Paulo, Brazil

Cryptorave 2019



Dave Maass
Senior Investigative Researcher
Electronic Frontier Foundation
Twitter: @maassive



Founded in 1990, EFF champions user privacy, free expression, and innovation through impact litigation, policy analysis, activism, and technology development.

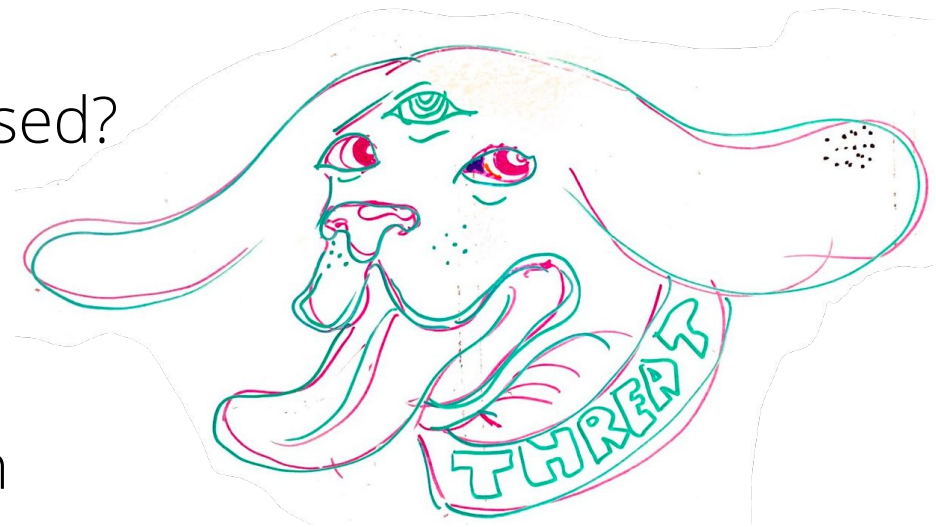
We work to ensure that rights and freedoms are enhanced and protected as our use of technology grows.

We have 31,000 active donors in 90 countries.

EFF Threat Lab

The EFF Threat Lab is a team that conducts deep-dive investigations into surveillance technologies:

- How and where is the tech used?
- How is the tech abused to target communities and individuals ?
- How can we counter the tech or hold its users/sellers accountable?



Not the official logo, but we like it.
It's a Threat Lab(rador)

Street-level Surveillance

eff.org/sls



Drones

Automated license plate readers

Cell-site simulators

Body-worn cameras

Biometrics (face recognition)

Predictive policing

Social media surveillance

Real-time crime centers

Why We Care

- Many forms collect information on you regardless of whether you've committed a crime
- Can make mistakes that negatively impact innocent people
- Often disproportionately impacts communities of color
- Prone to abuse by bad actors within an agency
- Chill free speech, expression, right to organize, and other rights

More Reasons to Care

- Can lead to policing driven by vendor relationships rather than community needs
- Use often kept secret, even from defense attorneys
- Even if conducted “in public” can capture personal information, such as where you seek medical care or legal services

Still don't care about privacy or justice?

Surveillance can also:

- Waste taxpayer money
- Open up government systems to breaches
- Misallocate resources based on data, not need

Drones



aka: unmanned aerial systems (UAS), unmanned aerial vehicles (UAV)

Cell-site Simulators



Source: Harris Corp.

CELL-SITE SIMULATOR SURVEILLANCE

Cell-site simulators trick your phone into thinking they are base stations.



Depending on the type of cell-site simulator in use, they can collect the following information:

- **1.** identifying information about the device like International Mobile Subscriber Identity (IMSI) number
- **2.** metadata about calls like who you are dialing and duration of call
- **3.** intercept the content of SMS and voice calls
- **4.** intercept data usage, such as websites visited.

Septier “Dream Catcher”



Source: Septier.com

Body-worn Cameras



Source: Houston Police Department



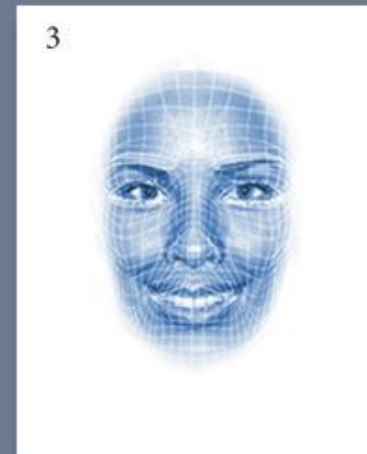
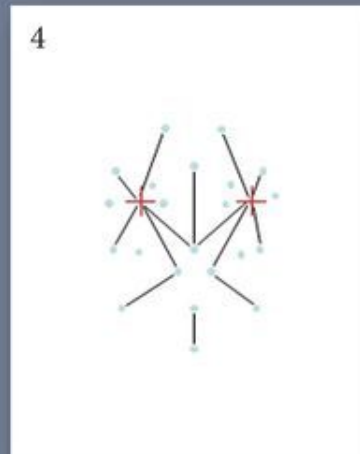
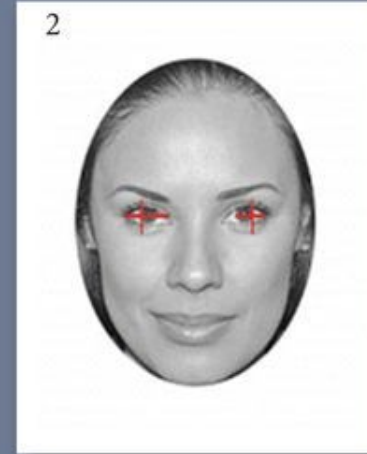
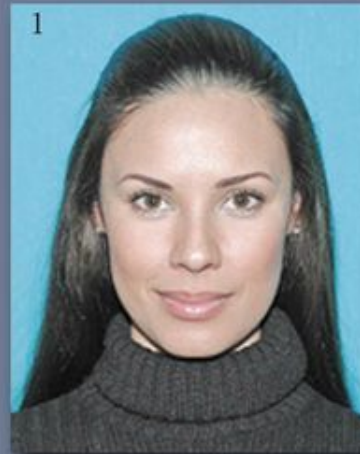
Body-worn camera footage from a 2015 protest Source: Seattle Police Department

Biometrics: Face Recognition

How facial identification works

1. Image is captured
2. Eye locations are determined
3. Image is converted to grayscale and cropped
4. Image is converted to a template used by the search engine for facial comparison results
5. Image is searched and matched using a sophisticated algorithm to compare the template to other templates on file
6. Duplicate licenses are investigated for fraud

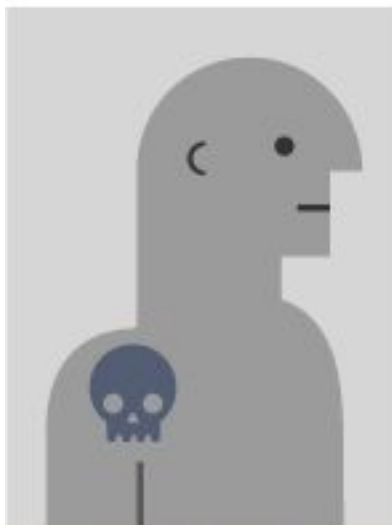
Source: Iowa Department of
Transportation



Tattoo Recognition

TATTOO IDENTIFICATION

Matching images of the same person's tattoo over time



SUBJECT



MATCH



MATCH



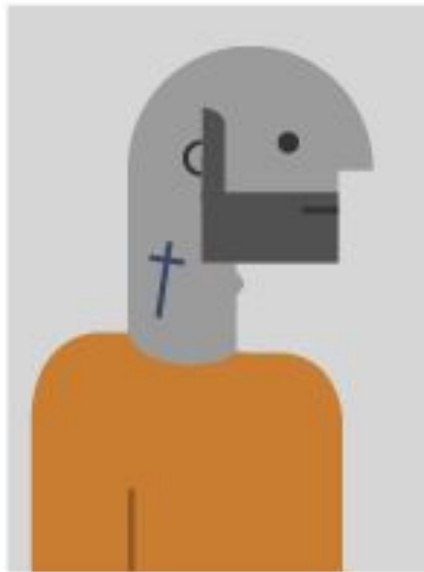
MATCH

TATTOO SIMILARITY

Matching tattoos from different people that share visual elements or symbolism



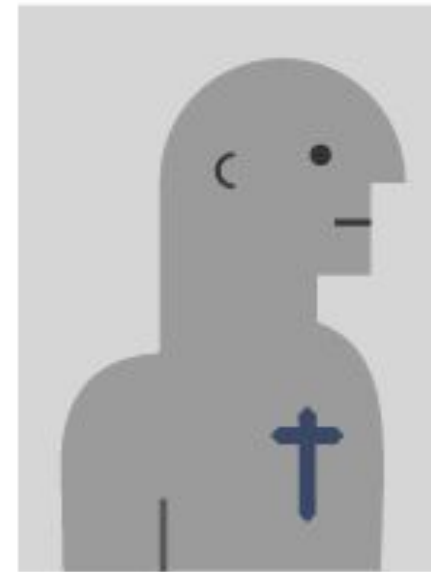
SUBJECT



MATCH



MATCH



MATCH

Surveillance Cameras



PTZ camera
(Pan-tilt zoom)

Real-time Crime Centers



Source: Fresno Police Department

Automated License Plate Readers



“Fixed” ALPR



“Mobile” ALPR

ALPR Use

- Real-time alerts on targeted vehicles
- Reveal historical travel patterns
- Identify visitors to specific locations
- Map community networks

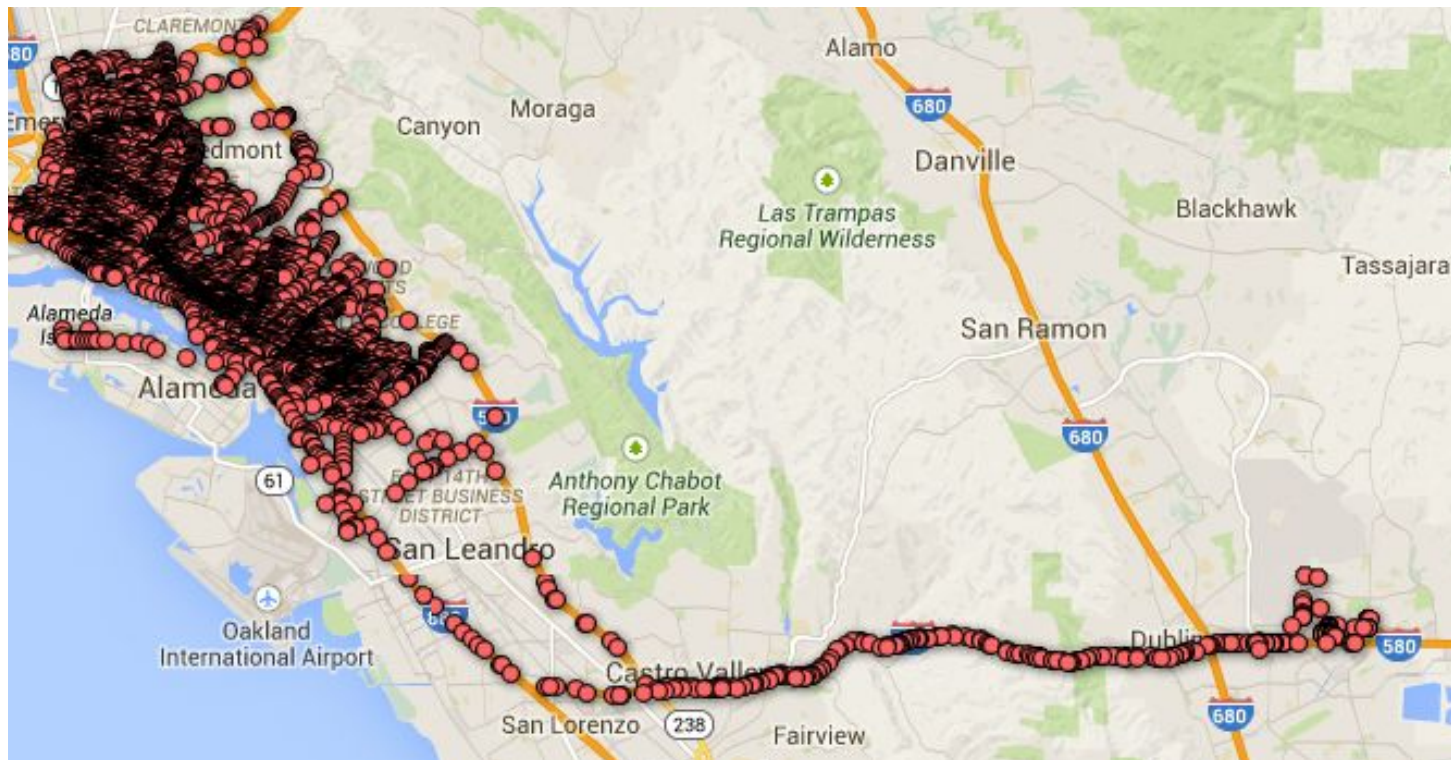


License plates have also been used to:

- Surveil mosques
- Spy on reproductive health clinics
- Blackmail gay club visitors
- To enforce immigration laws
- Target journalists
- Track welfare recipients

* These examples include non-ALPR use of license plates

Oakland 2014: 2 Cars, 1 City



7 days = 63,272 license plate scans

ACLU/EFF vs. LAPD/LACSD

California Supreme Court:

“...the scans are not conducted as part of a targeted inquiry into any particular crime or crimes. The scans are conducted with an expectation that the vast majority of the data collected will prove irrelevant for law enforcement purposes.”

Why I think it's the worst

- Cheap
- Widely adopted (even in rural areas)
- Indiscriminate
- Real time & historical
- Difficult/illegal to circumvent
- Inadequate controls/oversight
- Paves the way for face surveillance and over video-based tracking
- Primary company has police sign non-disclosure agreements

“Data-Driven” or Predictive Policing and Algorithms



City Staff: IBM Watson can predict crime with 99% accuracy.

Mayor: We should add .50 caliber guns!

Staff: ...

Mayor: I'm joking.

Staff: How about face recognition and drones?

Mayor: Get it done before anyone finds out.



Surveillance Oversight

CCOPS: Community Control of Police Surveillance

SERO: Surveillance Equipment Regulation Ordinance

General requirements:

- Public hearing
- Police must create a surveillance impact report
- Elected officials must approve use purchase/policy
- Police must report back every year or so.

Passed in Seattle, Santa Clara County, Berkeley, Davis, Oakland.

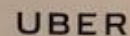
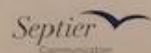
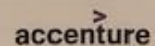
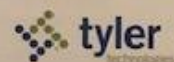
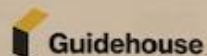
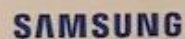
How We Research Surveillance #1

Too often decision about policing are made in conversations between vendors and cops.

One place this happens:
Police conferences

IACP 2018 Sponsors: Thank You

With the support of these organizations, IACP is able to provide many conference services for our attendees.



Septier's Dream Catcher

Thank You to Our
Technology Track Room Sponsor

DREAM
Catcher

come visit us
at booth #1078

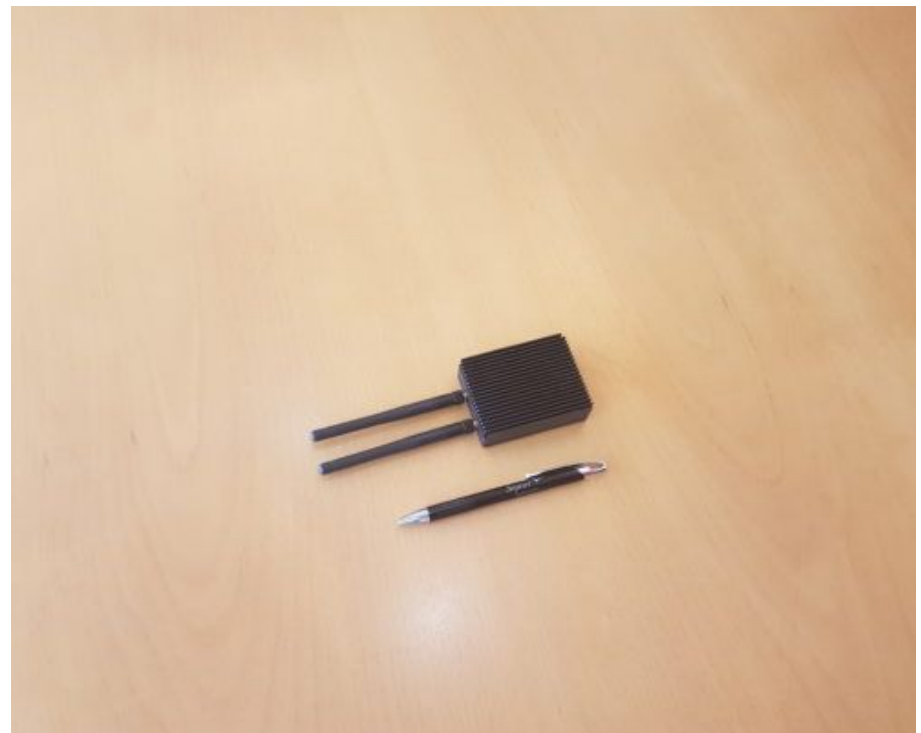
**THE IMSI CATCHER
YOU ALWAYS DREAMED OF**

- Cellular identities extraction
- Cellular gateway and checkpoints

**LOCATE YOUR MOBILE TARGETS,
ANY TECHNOLOGY, ANY NEED**

- True 4G positioning capabilities
- Unified positioning sensor
- High accuracy tactical positioning

IACP
International Association of
Chiefs of Police



Source: Septier Communication

AWS's Relaxation Zone



PICK UP YOUR FREE
16" STUFFED YETI!



**BOOTH
#1007**

REGISTER TO WIN A
RTIC 65 COOLER.



Getac

**WE'RE
FOR LAW**

F110
11.6"
RUGGED TABLET



Source: https://youtu.be/4W_n9VhvEbs



Source: Axon

IACP 2019 Trend: Combining Technologies

Vigilant Solutions (ALPR) acquired body-worn cameras

Shotspotter (gunshot detection) acquired predictive policing

Axon (Tazer/body cams) acquired a virtual reality training system



IBM Intelligent Video Analytics

Also known as the most depressing, dystopic vision marketed as an AI breakthrough.

Beyond face recognition: track people with age, gender, facial hair, hair color, clothing colors and patterns.

Multiple Attribute Query Example

Caucasian male, bald
with eyeglasses



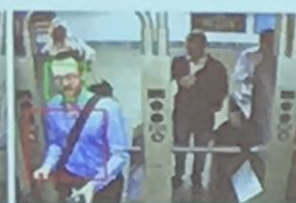
Bald="Yes"

Skin="Light"

Eyeglasses="Yes"



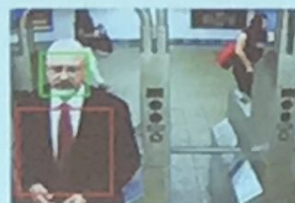
90.89
Eyeglasses 98.14
Bald 95.44
Skin Tone 79.10



88.98
Eyeglasses 99.02
Bald 77.54
Skin Tone 90.38



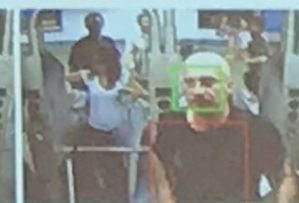
88.60
Eyeglasses 99.20
Bald 78.97
Skin Tone 87.64



86.36
Eyeglasses 81.72
Bald 87.06
Skin Tone 90.29



84.23
Eyeglasses 78.99
Bald 77.11
Skin Tone 96.58



83.08
Eyeglasses 90.85
Bald 75.72
Skin Tone 82.69

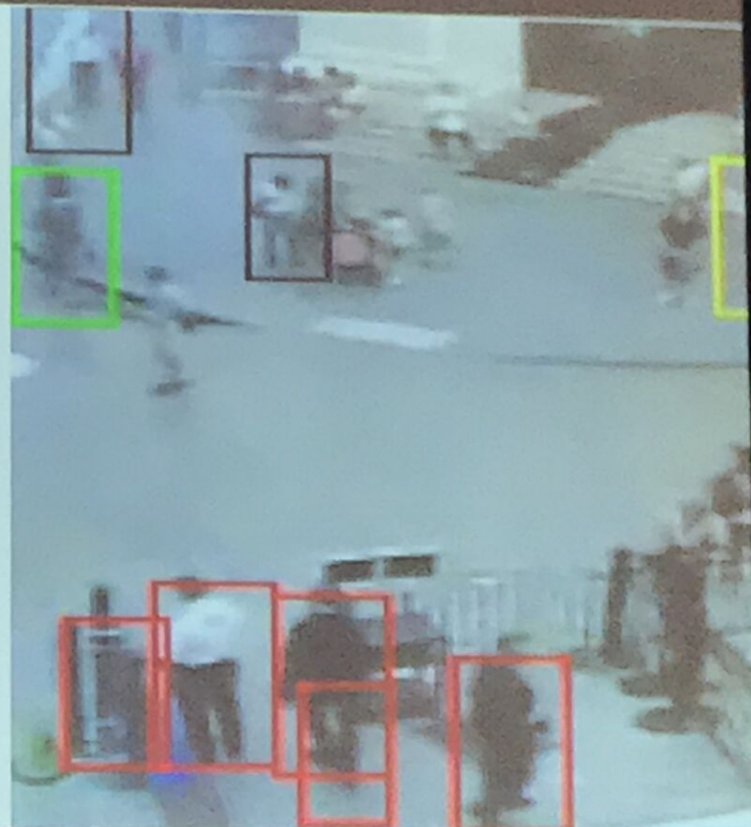
Tracking

- Shows the path that the object has gone through.
- Passing the cursor over the line shows the event photo.
- Clicking the photo displays the recorded video of the event.
- Activity Histogram



Crowd monitoring

- Identify what to watch (i.e. people gathering in locations / flash mob situation)
- Determine the situation for awareness (i.e. number in one area over time period)
- Notify personnel to address crowd management
- Face capture, facial search
- Crowd behavior
- Counting
- Loitering



How We Research Surveillance #2

Freedom of Information/Public Records Requests

U.S. Federal:

Freedom of Information Act

California State:

California Public Records Act

San Francisco Municipal:

Sunshine Ordinance

Drones at UC Berkeley Protests

Mission Approved by: Cmndr. T. Madigan
Requestor's Agency: Berkeley Police
Agency Phone Number: 510-667-7721

Mission Details:

SUAS Pilot: Dep. A. Pagliari

SUAS Observer: Sgt. D. Bonnell

SUAS Make/Model: DJI Phantom 4

Location: Berkeley Police

Type of Airspace: G

Weather: Clear

Wind: Calm

FAA Controlling Agency, i.e., NORCAL, Control Tower: NORCAL/KOAK

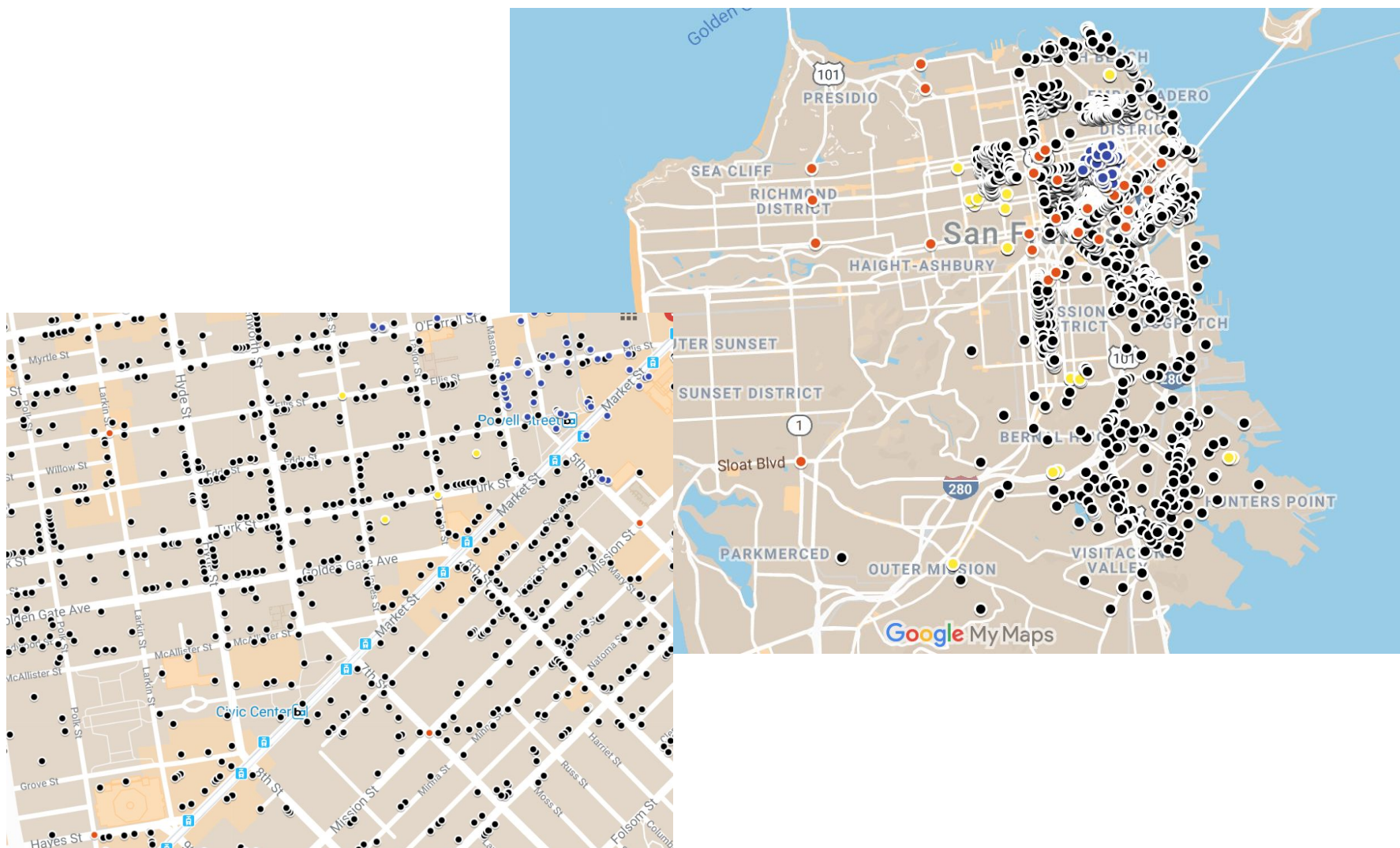
Frequency Used: 125.35/118.3

Risk Analysis Form Completed: Yes ☒ No ☐

Mission Description: On the above date and time, Deputy A. Pagliari and I were assigned as operators on the UAV team for a planned protest in Berkeley. We were assigned to observe a free speech event taking place in the park (Martin Luther King Jr. Civic Center Park), which is located across the street from the Berkeley Police station. Our objective was to observe the event and only deploy the UAV if we were provided reports of a felonious act taking place and/or for the preservation of life.

San Francisco Security Cameras

110	2859-A Mission St.	SFDA Security Camera Interactive Map/Community Safety	-122.4182457	37.751306
111	3229 21st St	SFDA Security Camera Interactive Map/Community Safety	-122.419531	37.756786
112	873 Capp St	SFDA Security Camera Interactive Map/Community Safety	-122.4171956	37.752786
113	3440 20th St	SFDA Security Camera Interactive Map/Community Safety	-122.41773	37.759026
114	401 Capp St	SFDA Security Camera Interactive Map/Community Safety	-122.417831	37.76016
115	Capp Street	SFDA Security Camera Interactive Map/Community Safety	-122.4178225	37.7570986
116	Capp Street	SFDA Security Camera Interactive Map/Community Safety	-122.4178225	37.7570986
117	177 Capp St	SFDA Security Camera Interactive Map/Community Safety	-122.4184684	37.7639473
118	238 Capp St	SFDA Security Camera Interactive Map/Community Safety	-122.4187032	37.7628457
119	272 Capp St	SFDA Security Camera Interactive Map/Community Safety	-122.41863	37.762347
120	326 Capp St	SFDA Security Camera Interactive Map/Community Safety	-122.4185325	37.7614269
121	396 Capp St	SFDA Security Camera Interactive Map/Community Safety	-122.418414	37.7604356
122	850 Capp St	SFDA Security Camera Interactive Map/Community Safety	-122.4176993	37.7531094
123	768 Capp St	SFDA Security Camera Interactive Map/Community Safety	-122.4177838	37.7544825
124	3254 23rd St	SFDA Security Camera Interactive Map/Community Safety	-122.4177788	37.7540153
125	5th and Market	SFDA Security Camera Interactive Map/Red Light Cameras	-122.4080855	37.7840326
126	19th and Geary	SFDA Security Camera Interactive Map/Red Light Cameras	-122.4783218	37.7803334
127	Bryant St & 6th St	SFDA Security Camera Interactive Map/Red Light Cameras	-122.4025347	37.7760457
128	Bryant St & 6th St	SFDA Security Camera Interactive Map/Red Light Cameras	-122.4025347	37.7760457
129	Bush and Van Ness	SFDA Security Camera Interactive Map/Red Light Cameras	-122.4218838	37.7885178
130	Larkin St & Ellis St	SFDA Security Camera Interactive Map/Red Light Cameras	-122.4177402	37.7842477
131	Folsom St & 1st St	SFDA Security Camera Interactive Map/Red Light Cameras	-122.3945241	37.7873347
132	Geary Blvd & Franklin St	SFDA Security Camera Interactive Map/Red Light Cameras	-122.4230431	37.7854856
133	Fulton St & Park Presidio Bl	SFDA Security Camera Interactive Map/Red Light Cameras	-122.47218	37.77319
134	Park Presidio Blvd & Geary	SFDA Security Camera Interactive Map/Red Light Cameras	-122.4722462	37.7805975
135	Guerrero and Cesar Chavez	SFDA Security Camera Interactive Map/Red Light Cameras	-122.422421	37.7479746
136	Harrison St & 8th St & San F	SFDA Security Camera Interactive Map/Red Light Cameras	-122.408536	37.7737729
137	Harrison St & 5th St	SFDA Security Camera Interactive Map/Red Light Cameras	-122.4018621	37.779049



MUCKROCK

Muckrock is non-profit that helps automate Freedom of Information request.

In February 2018, EFF and Muckrock began filing 1,000 Freedom of Information requests across the country for data related to automated license plate readers.

Automated License Plate Readers

LEARN

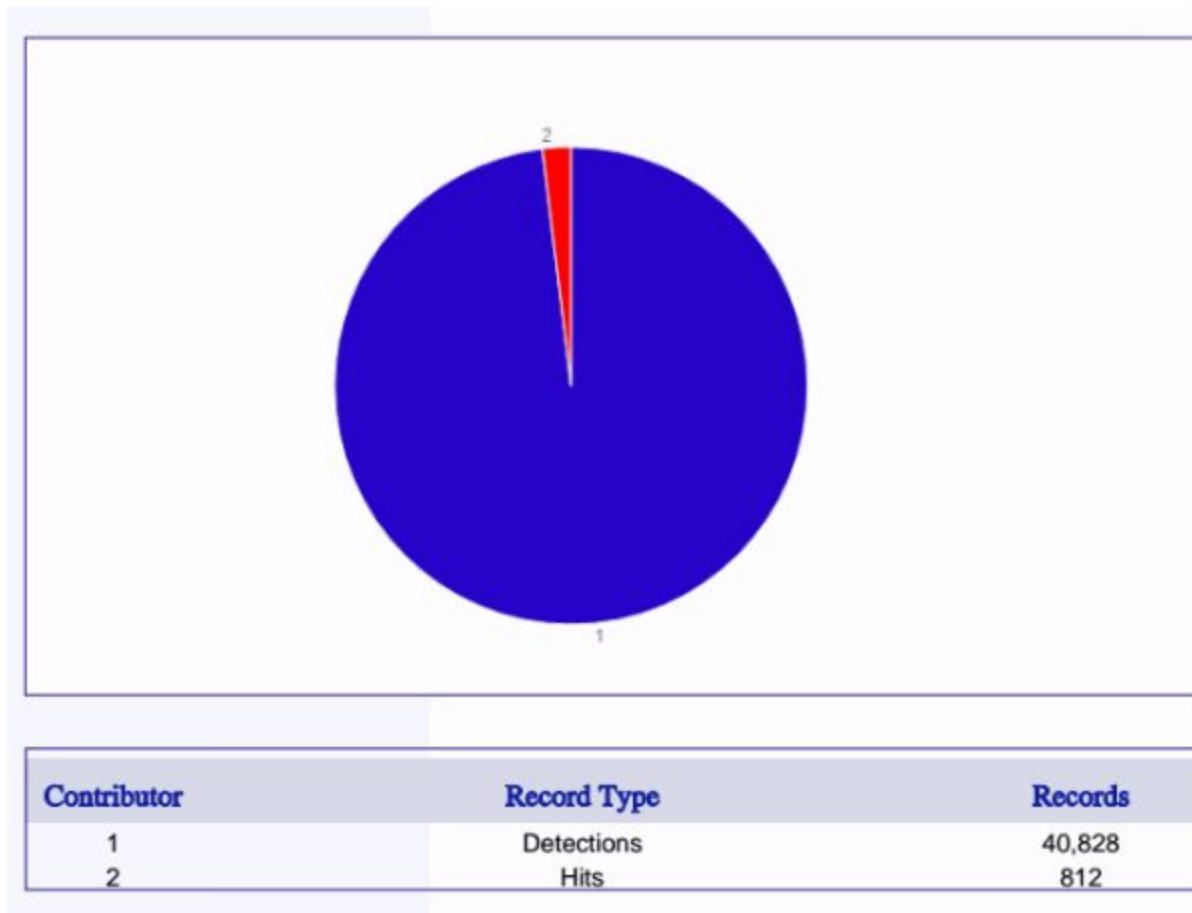
Agency
Data Sharing Report



Detections Shared

The Kennesaw Police Department Agency is Sharing its Detection data with the following Agencies:

100th Judicial District Attorney Traffic Enforcement	17th Judicial Circuit Drug Task Force
21st Drug Task Force	24th Judicial District Drug Task Force
32nd Judicial District Attorney Office	Abbeville Police Department
Acworth Police Department	Adel Police Department
Adrian Police Department	Alameda County Narcotics Task Force
Alapaha Police Department	Alma Police Department
Antioch Police Department CA	Aragon Police Department
Athens-Clarke Police Department	Austin Police Department
Avondale Estates Police Department	Baker County Sheriff
Baldwin County Sheriffs Office	Ball Ground Police Department
Banks County Sheriff's Office	Banks County Sheriff's Office



Long County Sheriff, Georgia

Big and Small Numbers

2.5 billion

Number of plate scanned and retained 2016-2017

0.5%

Percentage of plates actually
flagged as relevant to an investigation

Source: 173 agencies in 27 states

Procurement Data

04-18-19	Social Security Administrat... DC	Kell Systems	PURCHASE LICENSE PLATE RECOGNITION (LPR) SYSTEM AND INSTALLATION <i>This result also matched on 2 other fields</i>	1	\$23,024.32	\$23,024.32
04-17-19	City of Thousand Oaks, CA	ATT Mobility	WIRELESS BROADBAND SVC - ALPR TRAILER 2/25-3/22/19FEDERAL	1	\$43.23	\$43.23
04-17-19	City of Douglasville, GA	Madden And Associates	LPR KIT FOR PD'S CURRENT LPR TRAILER. SOLE SOURCE. <i>This result also matched on 2 other fields</i>	1	\$9,695.00	\$9,695.00
04-16-19	Township of Mount Olive, NJ	L3 Mobile-Vision Inc	HD IN CAR CAMERA SYSTEMS <i>This result also matched on 2 other fields</i>	1	\$19,774.80	\$19,774.80
04-15-19	City of Hollywood, FL	Verizon Wireless	Data for license plate readers (lpr's) - 20g Pricing per state of florida/dms Contract #dms-10/11-008c Line added on 05-16-2017	1	\$700.07	\$700.07
04-09-19	Florida Atlantic University, FL	Urbanik Services And Supplies	P-7341 ALPR Security Police camera pole damage parts removal and repairs	1	\$700.00	\$700.00

Govspend/Smartprocure

How We Research Surveillance #3

With the help of some friends
(crowdsourcing)

Atlas of Surveillance Project



Atlas of Surveillance Goals

- Create first ever-inventory of law enforcement surveillance
- Allow people to look up what is in their communities
- Allow researchers to compare trends across the nation
- Train students and volunteers in research techniques
- Increase greater understanding of surveillance in society

Surveillance Isn't Always Secret

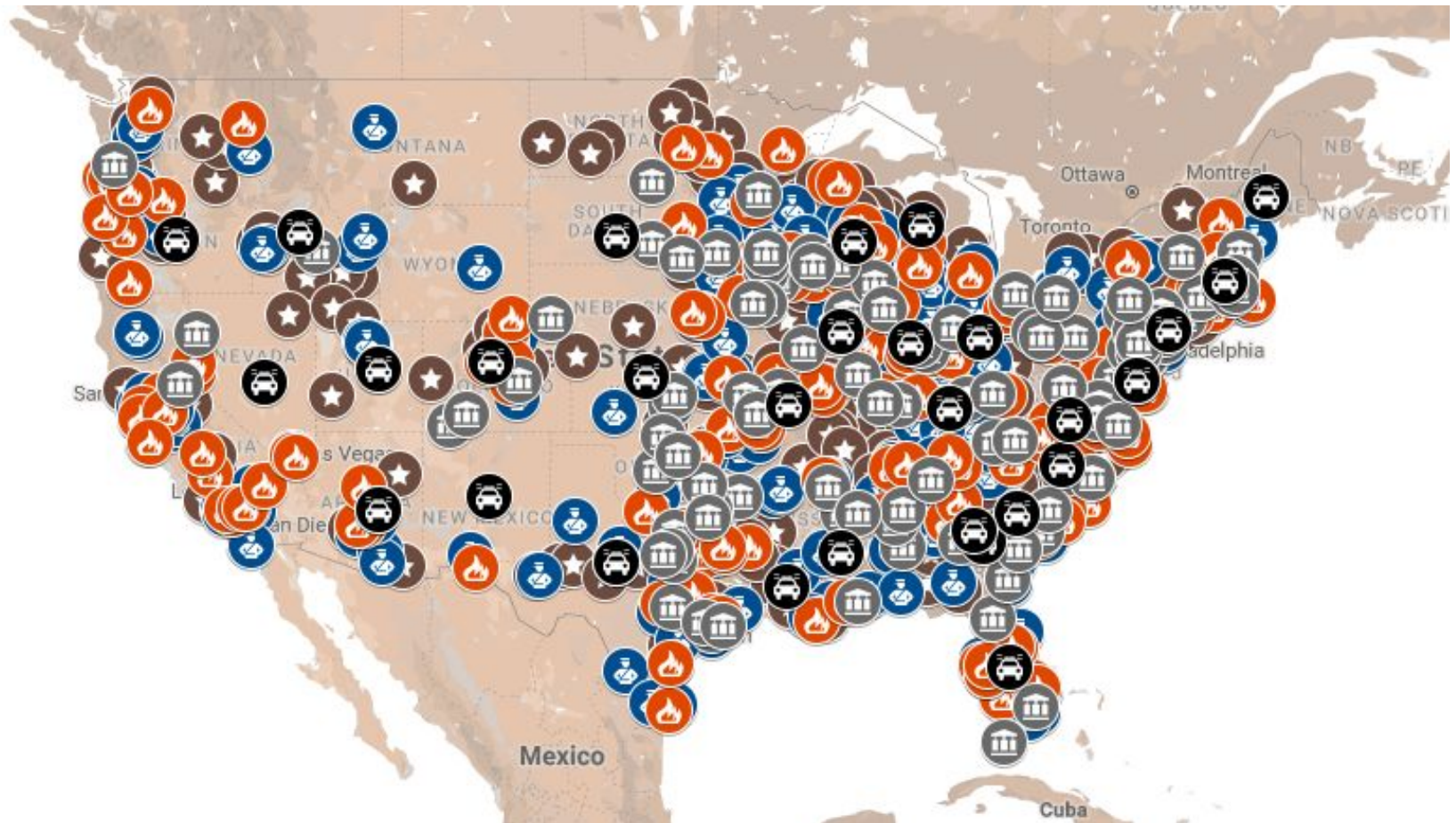
It just hasn't been aggregated before.

- Agencies and companies like to advertise technology
- Government policies are often online
- Reporters write about surveillance frequently
- Advocacy organizations frequently file FOIA requests
- Many datasets already exist
- Procurement data is not usually secret

Research Methods

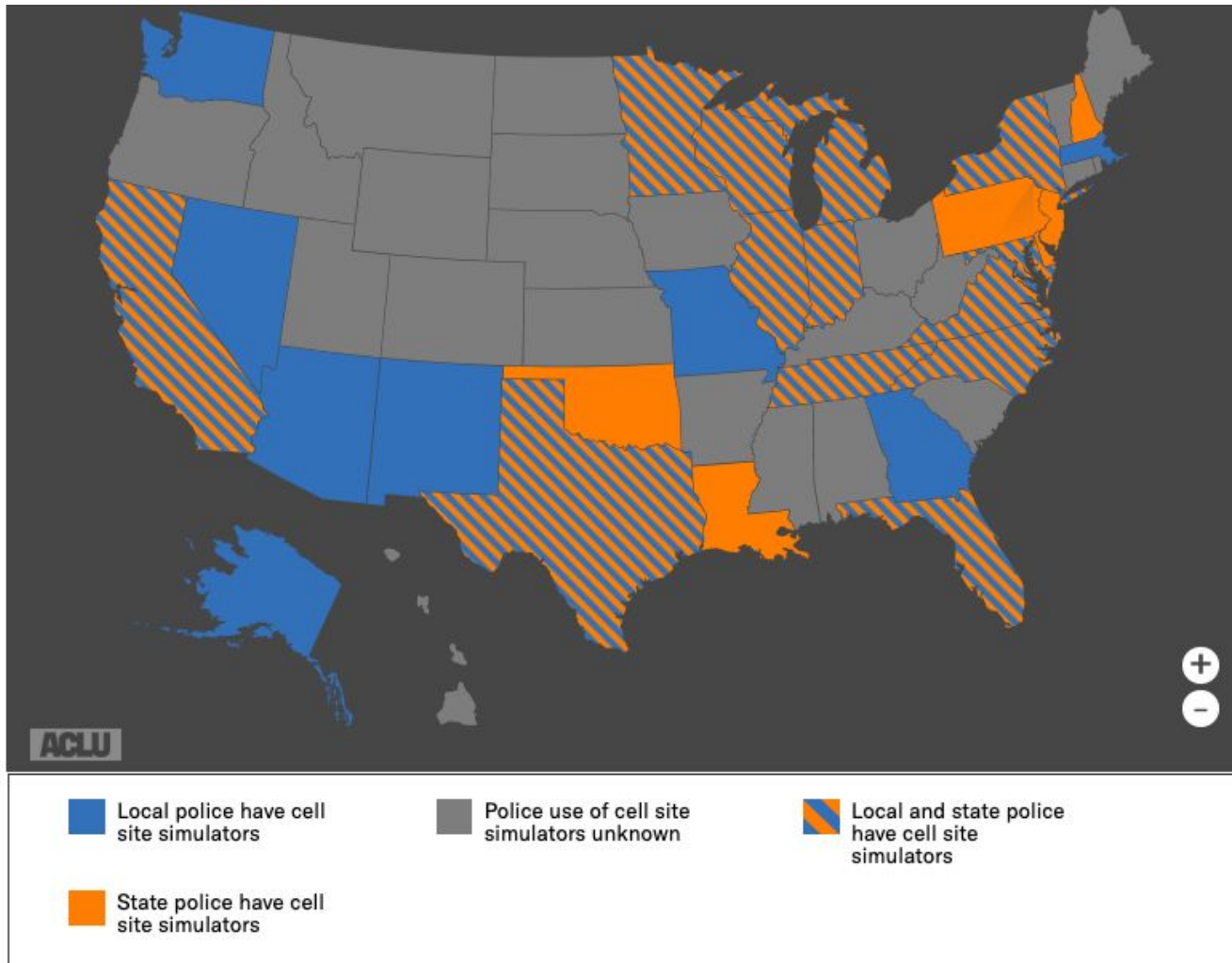
1. Collect existing datasets
2. Create an automated assignment system to have a large number of students gather information using search engines and browsing government websites.
 - News stories
 - Press releases
 - Policies
 - FOIA documents

Bard College Center for the Study of the Drone: Public Safety Drones



<https://dronecenter.bard.edu/public-safety-drones-update/>

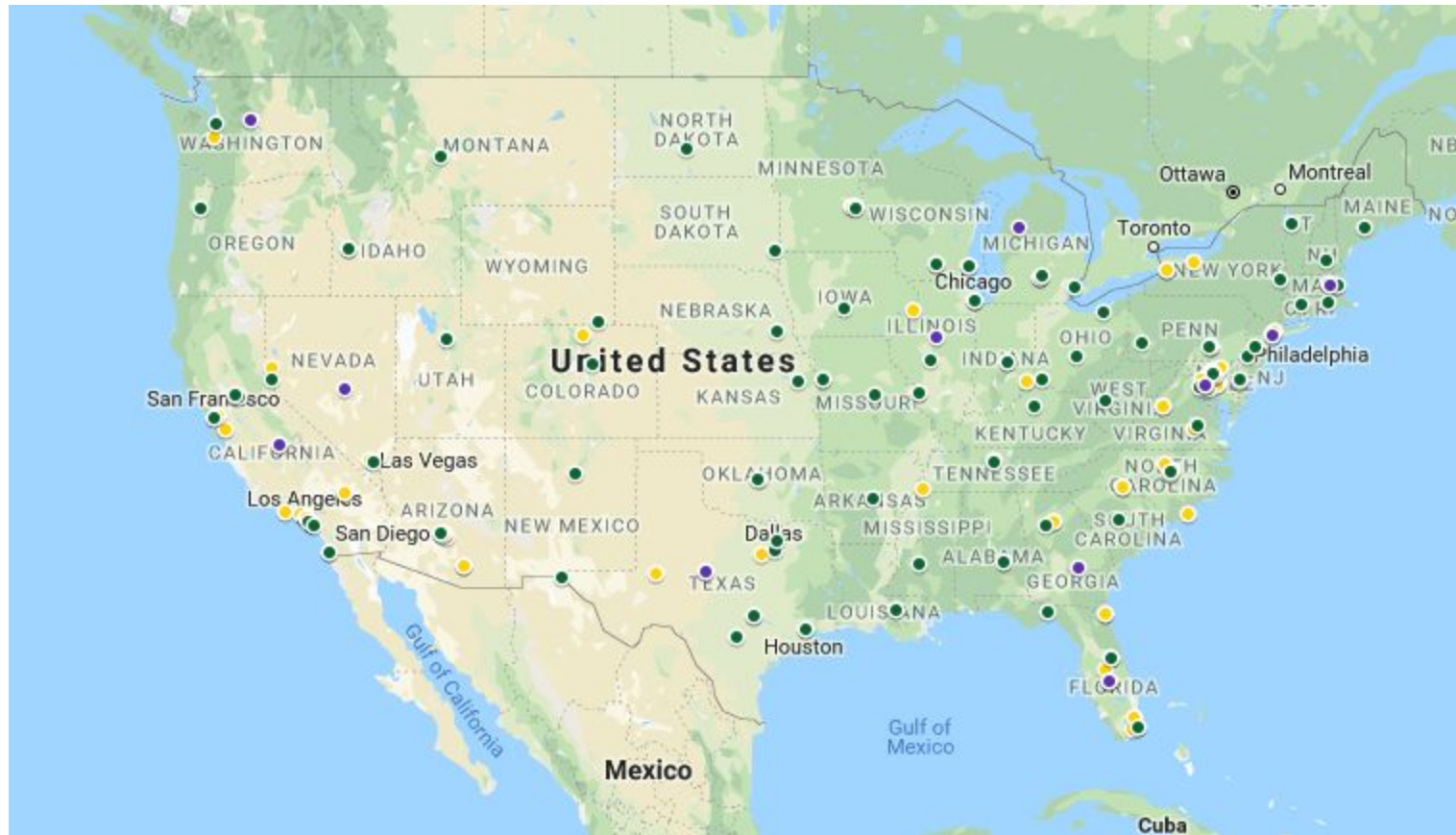
ACLU: Cell-site Simulators



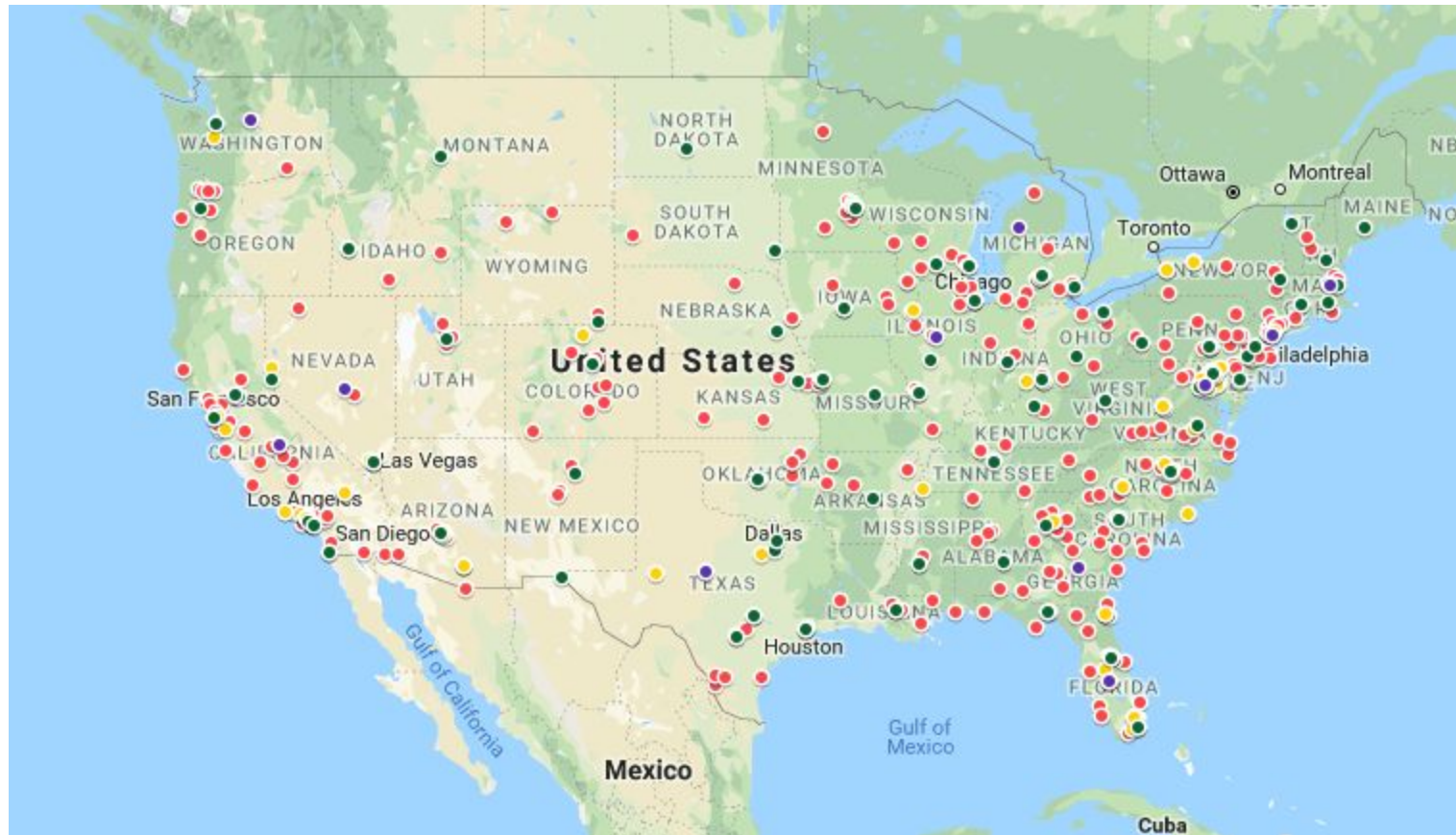


Airports with face recognition

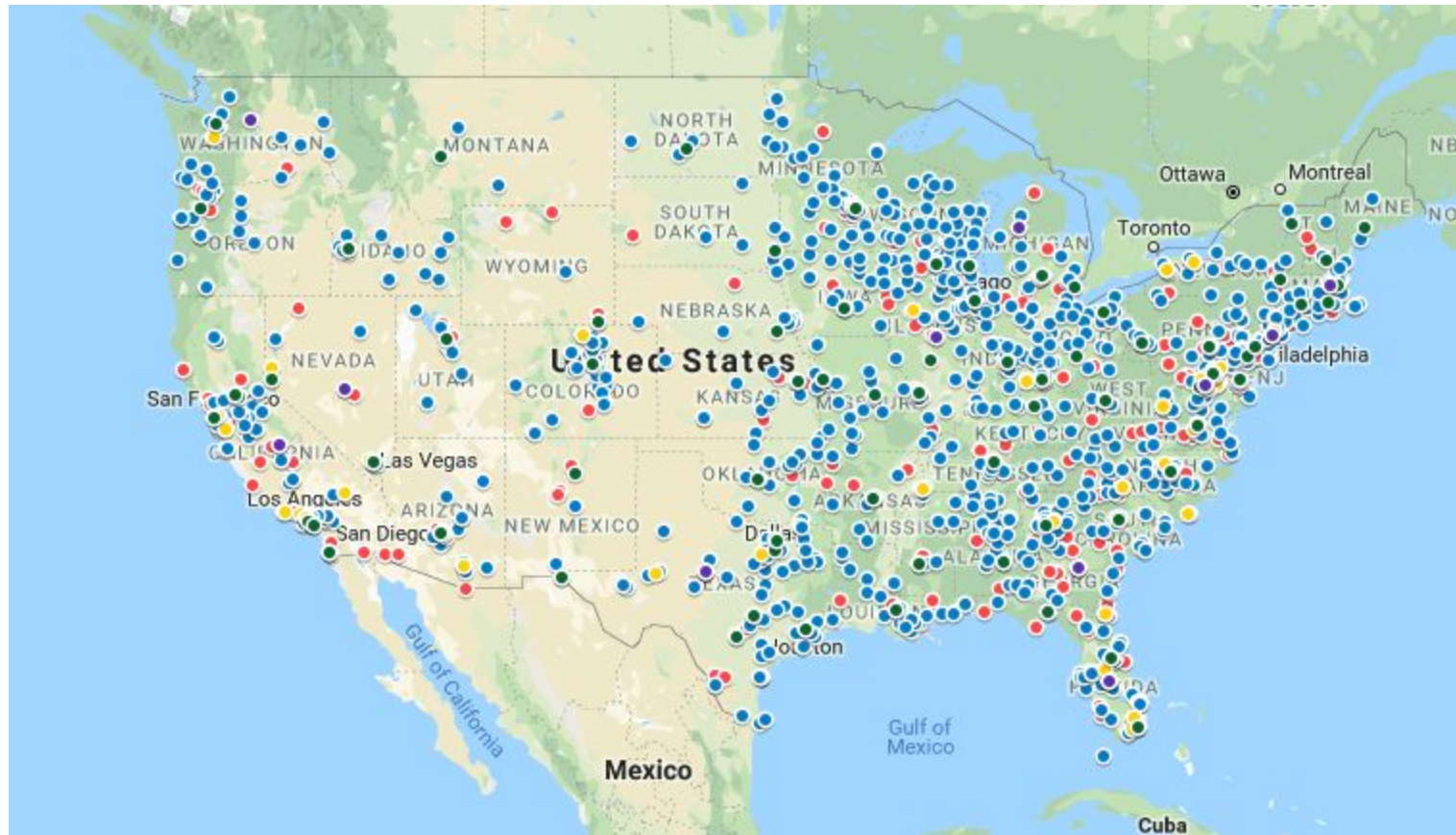




**Airports with face recognition +
“Fusion centers” + Cell-site simulators**



**Airports with face recognition +
“Fusion centers” + Cell-site simulators +
Grants for body-worn cameras**



**Airports with face recognition + “Fusion centers” + Cell-site simulators +
Grants for body-worn cameras + Bard College’s drone data**



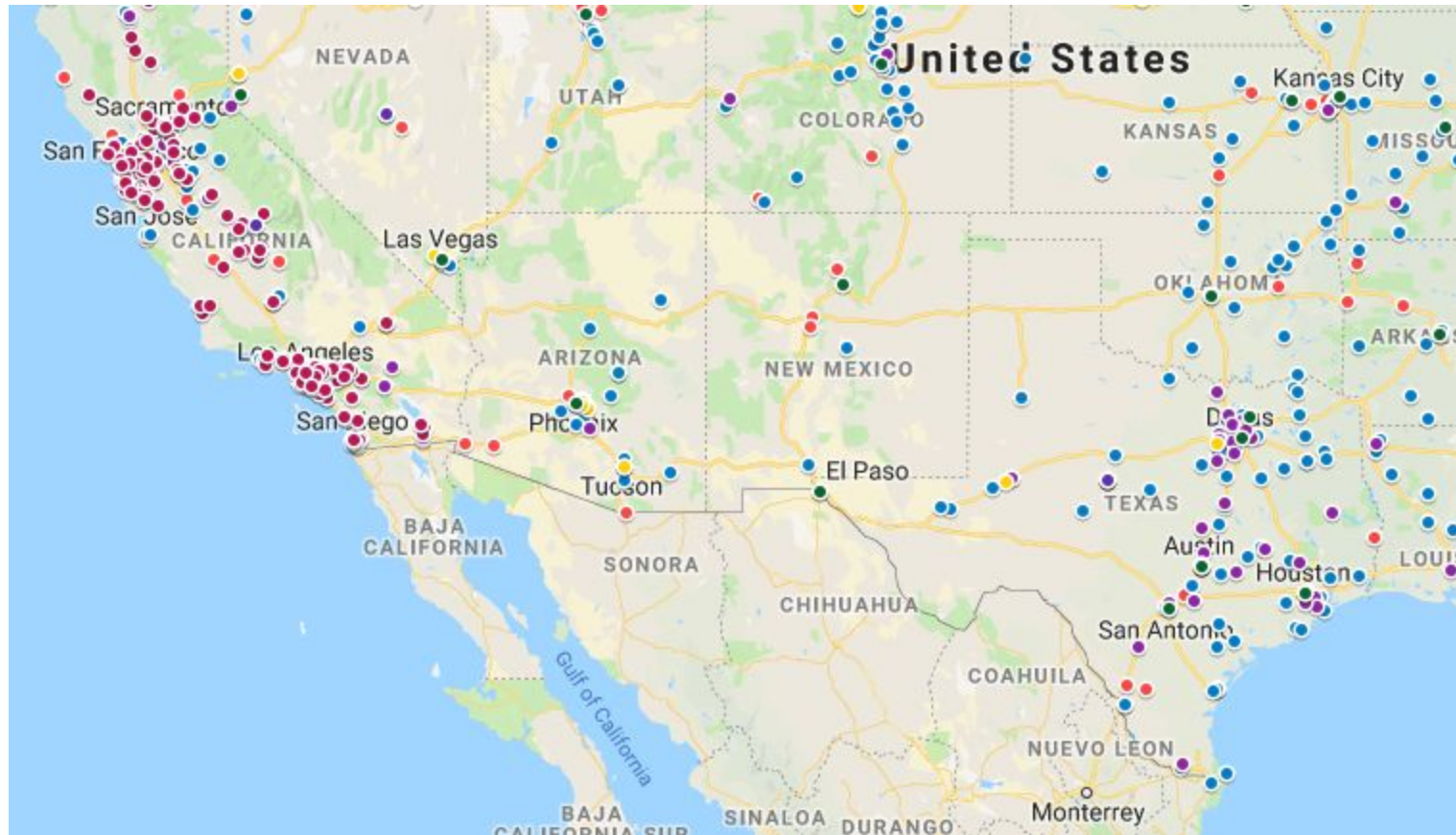
Atlas of Surveillance: Pilot

65 Students

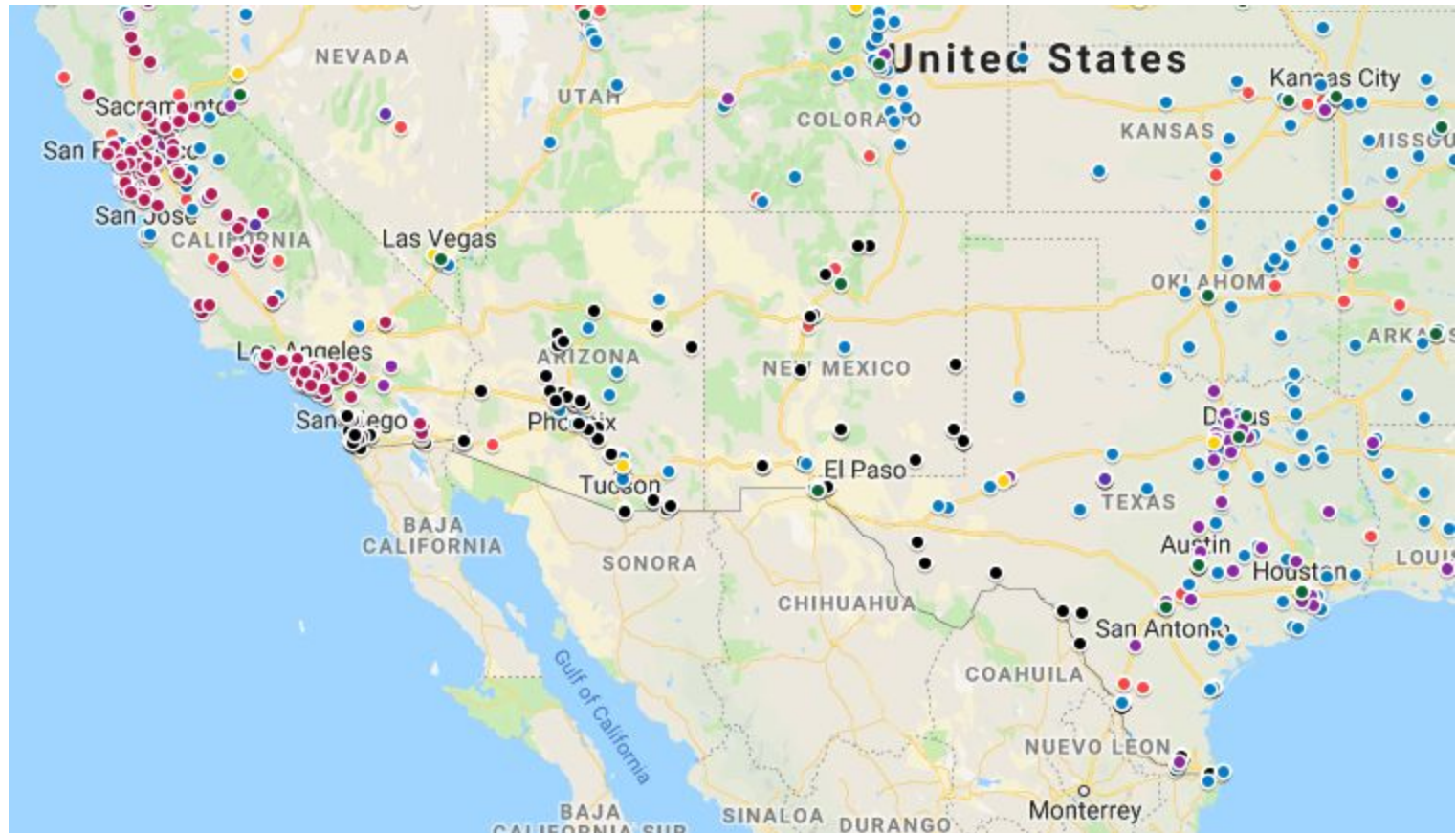
Students were assigned to do small research assignments for surveillance technologies in cities and counties along the U.S.-Mexico border.

Students found more information when provided with tips from procurement data.

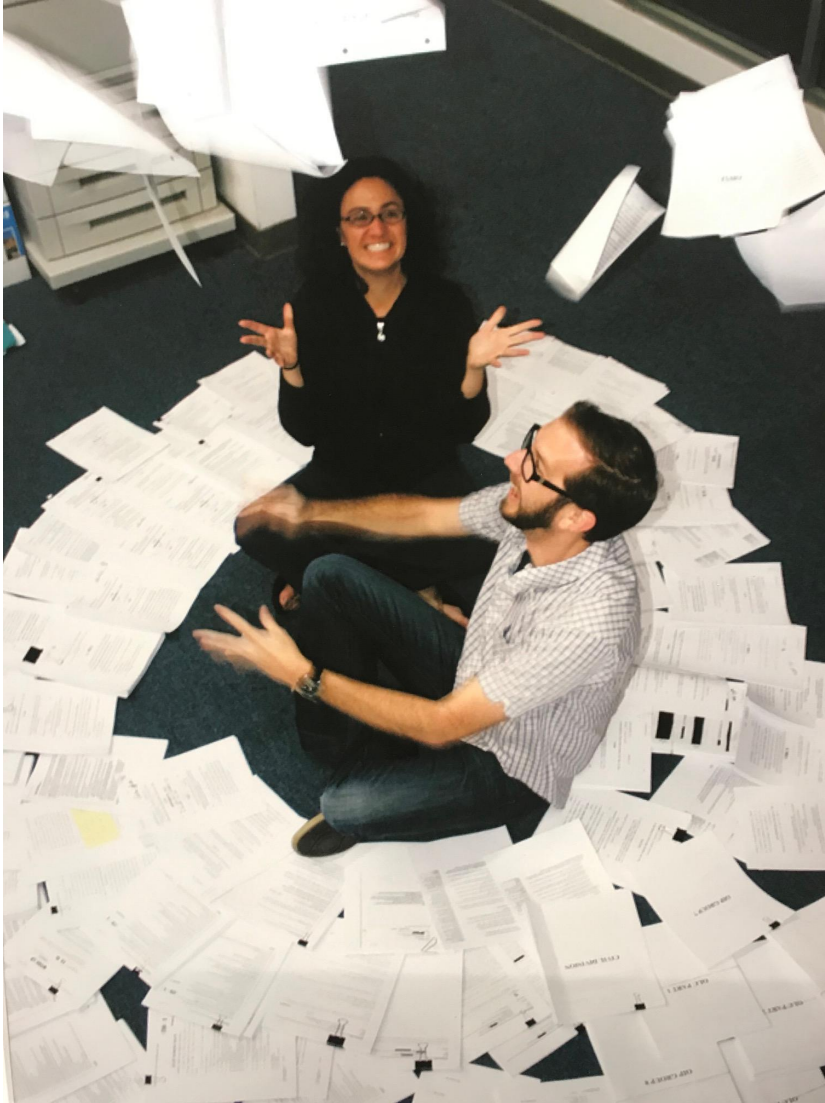
Fall 2019: 150 students



Zoomed in on the U.S. Border Region

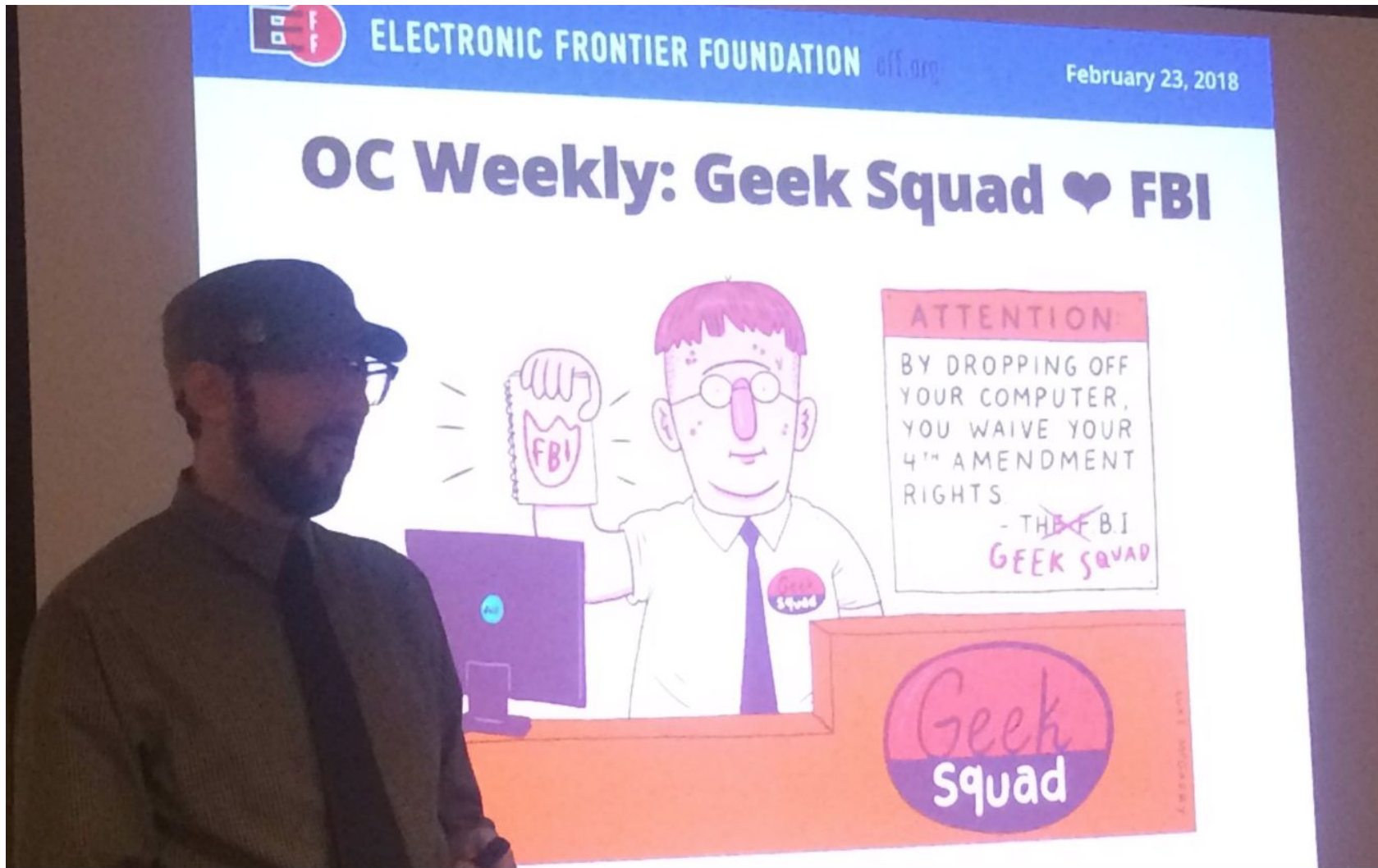


Black dots:
Student research through Atlas of Surveillance

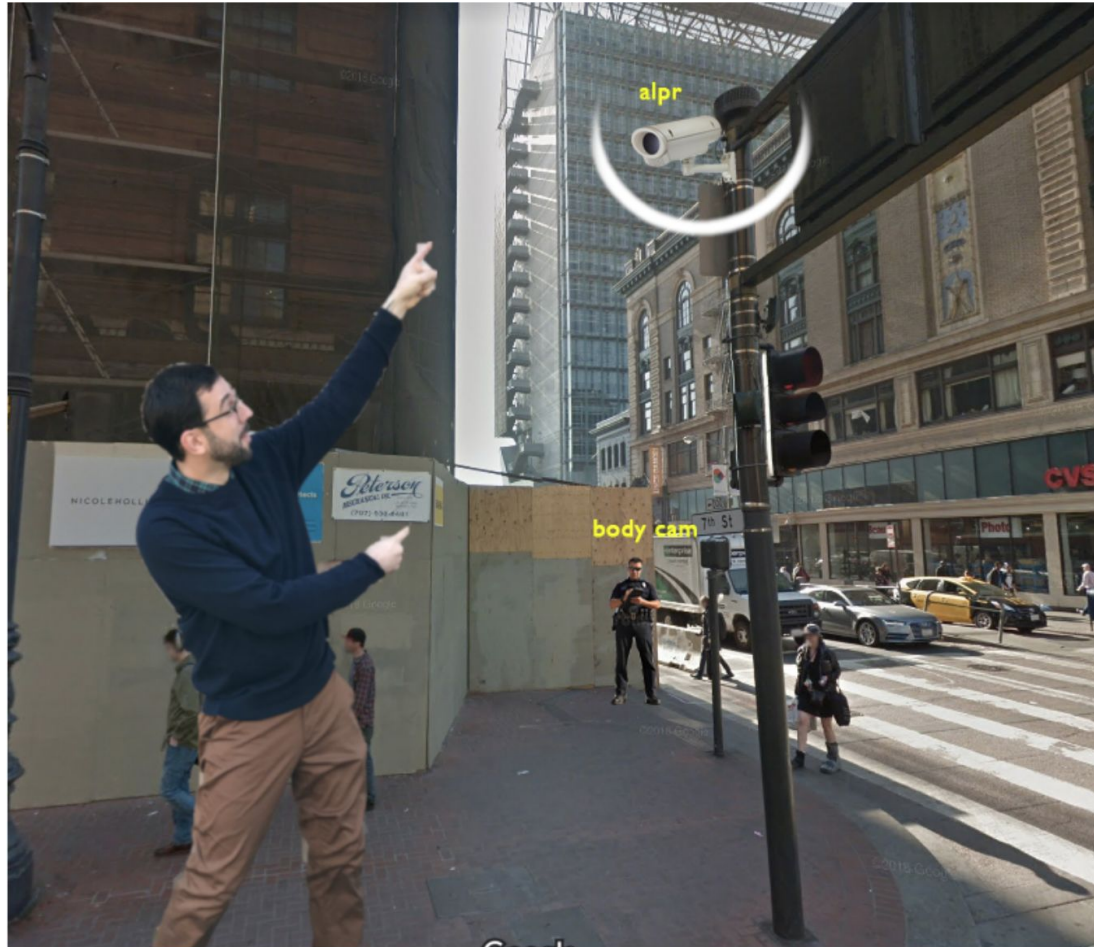


**Too often our work
looks like this**

	A	B	C	D	E	F	
1	State	Locality	Federal Award FY	Federal Award FY	Federal Award FY	Federal Award FY 2018	
2	AK	Juneau		\$25,060			
3	AL	University of North Alabama		\$5,707			
4	AL	Florence		\$69,916			
5	AL	Dothan		\$202,500			
6	AL	Birmingham		\$300,000			
7	AL	Andalusia, City of	\$87,224				
8	AL	Jefferson County				\$702,000	
9	AL	Tuscaloosa County Commission				\$30,000	
10	AR	University of Arkansas- Fort Smith		\$12,000			
11	AR	Arkansas Tech University		\$17,656			
12	AR	Fayetteville		\$186,496			
13	AR	City of Jonesboro				\$300,000	
14	AZ	City of Yuma		\$104,988		\$115,500	
15	AZ	County of Yuma			\$31,917		
16	AZ	Glendale, City of	\$449,986				
17	AZ	Nogales Police Department				\$82,500	
18	AZ	Peoria, City of	53,170		\$26,360		
19	AZ	Salt River Pima-Ma	193,596				
20	AZ	Tucson			\$375,000		
21	CA	Coalinga		\$4,000			
22	CA	Fort Bragg		\$25,219			



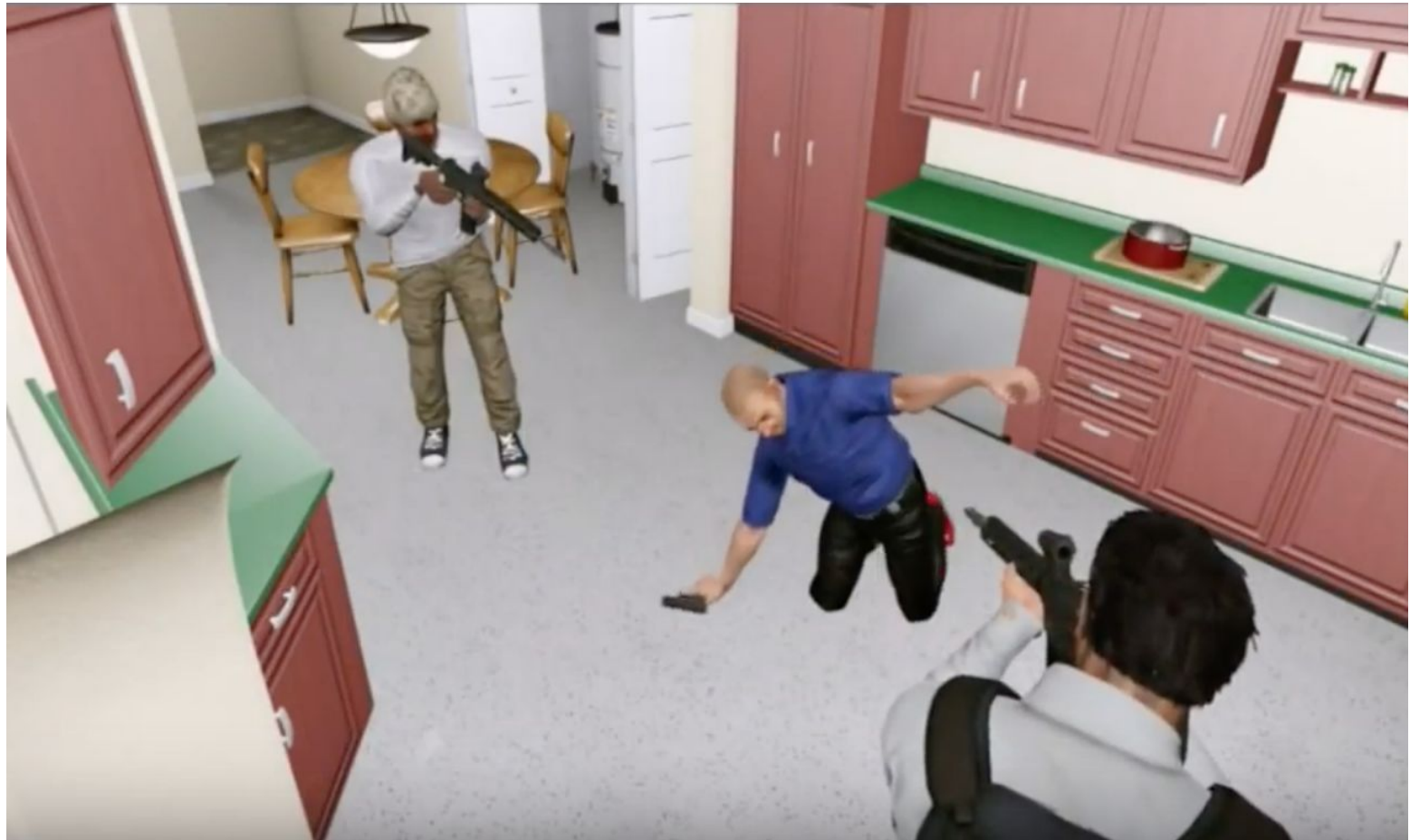
When it should look like this





What about virtual reality?

Training



Source: motionrealityincorporated.com

Sobriety Testing

Impairment is the Problem.



Visulyzer

is the Solution.



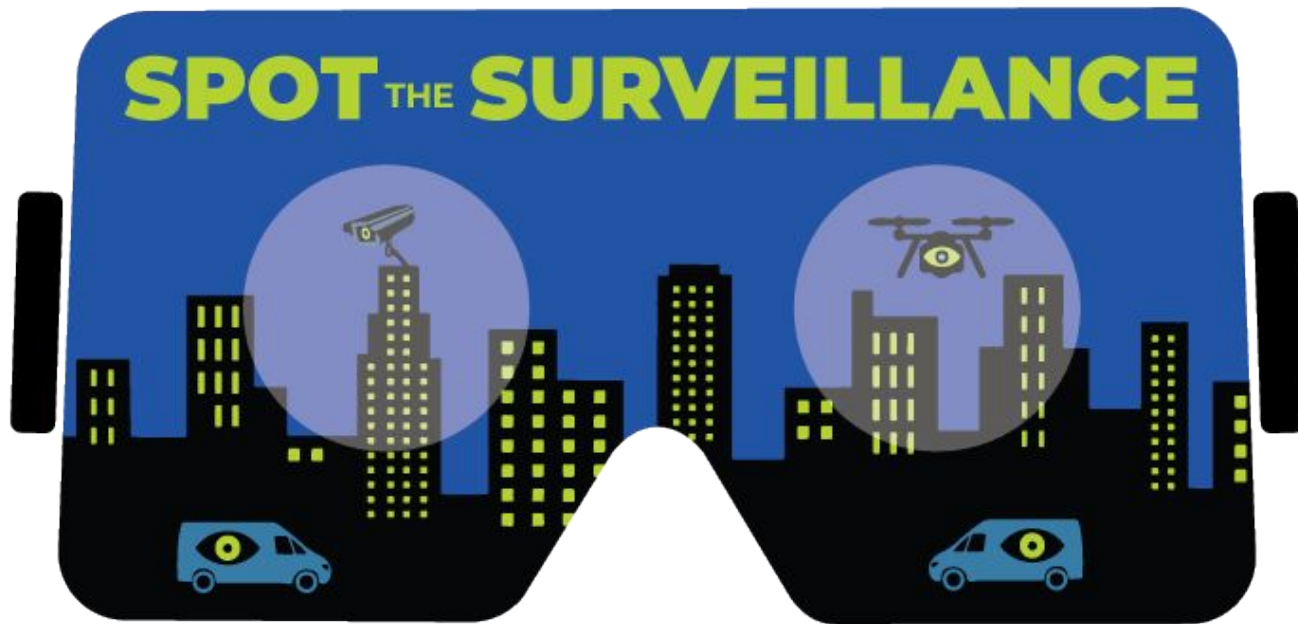
Situational Awareness



Source: bounceimaging.com

Spot the Surveillance

eff.org/spot



Spot the Surveillance is a virtual reality (VR) experience that uses a simulation to teach people how to identify the various spying technologies that police may deploy in communities.

A VR Experience for EFF

Considerations

- Meaningful advocacy experience
- Does not collect biometrics
- Easy to access on different platforms/devices
- Open source
- Accessibility
- On a modest budget

The Concept

The user is placed in a street-scene. They look around for surveillance technology. When they find one, they are provided with details of what the technology does and how police use it.

The Goals

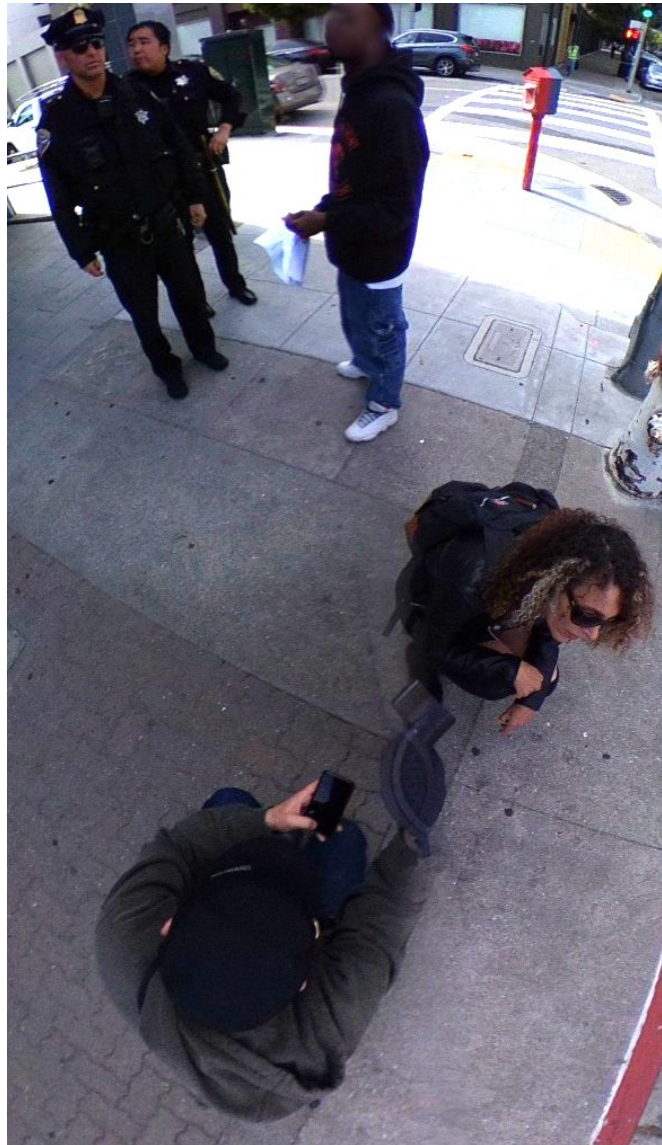
- Can we do VR on a non-profit budget?
- Educate people about various forms of surveillance
- Train people where to look for these devices in daily lives
- Help people practice situational awareness in a high-stress situation (e.g. a police encounter)

360° photography



Stepping over over the “uncanny valley.”







Launched Nov. 5, 2018



First public demonstrations
Aaron Swartz International Hackathon at the
Internet Archive



Tried out [@EFF](#) Surveillance spotting **VR** quiz at [@bigroomstudios](#) [#VRday](#) - @nickkauf, Portland, ME



Patrick Olivier @patricklolivier · Nov 6

Finally, something worth doing with **VR**!!! “EFF Unveils Virtual Reality Tool To Help People Spot Surveillance Devices in Their Communities”



FeralBat /\^._.^/\ ♪
@londonbel0w

Follow



vr tech is so fucking rad i just went spinning through my apartment pinging spytech on the screen of my tracking device LOL*sob*



Bayse @bbark5 · Nov 6

Replying to @EFF

This **VR** experience could be useful to the public especially, because it gives the public knowledge on what the police are using to watch our communities. I myself, kind of knew about police watching our every move but not as much as I thought. I think this is a great topic to hit

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